# BLANDING CITY RESERVOIR #4

## Introduction

Blanding City Reservoir #4 is an off-stream reservoir on the south slope of the Abajo Mountains. The Mormon pioneers settled the area in the late 1800's, and diverted clear water from the mountain streams for culinary use. Blanding City Reservoir #4 was built in 1965 to retain spring runoff for usage throughout the summer. It is a small reservoir, but larger than nearby Blanding City Reservoir #3, which is larger than either of its predecessors. Reservoir #1 is no longer in service, Reservoir #2 is used entirely for agricultural purposes, #3 is maintained at the conservation pool level. Reservoir #4 the primary source of water for Blanding City.

The reservoir shoreline is owned by Blanding City. Public access is unrestricted. The impoundment, an earth-fill dam, was built in 1965. Present and anticipated

**Characteristics and Morphometry**

| | |
|---|---|
| Lake elevation (meters / feet) | 2,010 / 6,600 |
| Surface area (hectares / acres) | 13 / 32 |
| Watershed area (hectares / acres | |
| Volume ($m^3$ / acre-feet) | |
| capacity | 838,781 / 680 |
| conservation pool | 270,000 / 219 |
| Annual inflow ($m^3$ / acre-feet) | |
| Retention time (years) | |
| Drawdown ($m^3$ / acre-feet) | |
| Depth (meters / feet) | |
| maximum | 14 / 46 |
| mean | 6.5 / 21.3 |
| Length (meters / feet) | 790 / 2,600 |
| Width (meters / feet) | 640 / 2,100 |
| Shoreline (km / miles) | 1.9 / 1.2 |

**Location**

| | |
|---|---|
| County | San Juan |
| Longitude / Latitude | 109 29 52 / 37 40 06 |
| USGS Map | Blanding North, Utah 1985 |
| DeLorme's Utah Atlas and Gazetteer™ | Page 22, A-3* |
| Cataloging Unit | Lower San Juan (14080201) |

(unlabeled, it is the reservoir at the north end of Reservoir Road.)

future water use is primarily for culinary and agricultural

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purposes with recreational use focusing on fishing.

**Recreation**

Blanding City Reservoir #4 is 4 miles north of Blanding. From downtown Blanding, travel north out of town near 400 West. The asphalt road winds through the desert past Reservoirs #2 and #3 and culminates at reservoir #4.

Aquatic recreation is limited to bankside fishing. Swimming, camping and boating are prohibited. Reservoir #3 has a city park with water and vault toilets. The nearest public campground is Devil's Canyon, a USFS facility 7 miles north of Blanding on US-191 with 32 campsites, drinking water and vault toilets. User fees are charged. There is also a private campground in Blanding (see info box).

**Watershed Description**

The Abajos are an isolated group of exposed laccoliths mountains that rise high above the redrock deserts. Much of the runoff seeps into the streambed and becomes silt laden as streams cut across various strata of differing erodibility and permeability cutting through the hogback ridges at the base of the mountains. In order to obtain clear water, the city built a 14 km long aqueduct to divert water from Johnson Creek high in the mountains and release it in their reservoir. The Johnson Creek watershed itself is further augmented with a second aqueduct though the Abajo ridgeline, which intercepts the north-flowing waters of Indian Creek and diverts them into the Johnson Creek drainage.

Blanding City Reservoir #4 is on a relatively flat area of the transition zone between the arid lands south the Abajo Mountains. The reservoir has a small natural watershed, but essentially all of the water comes from the mountains.

The watershed high point, the west shoulder of Abajo Peak, is 3443 m (11,295 ft) above sea level, thereby developing a complex slope of 7.5% to the reservoir. The average stream gradient above the reservoir is **?3.0??** (Need Abajo Peak quad)feet per mile).

The watershed is composed of high mountains above the aqueduct and low desert below.

The vegetation communities are comprised of spruce-fir, aspen, pine, alpine, and pinyon-juniper with grasses and forbes near the reservoir. The natural watershed is low desert with sagebrush. The watershed receives 30 - 76 cm (12 - 30 inches) of precipitation annually with a frost-free season of 120 - 140 days at the reservoir.

Land use in the mountains is 100% multiple use, with the exception of a small privately owned parcel around the now inactive Gold Queen Mine on the west face of Abajo Peak. The major use of the watershed is livestock grazing.

**Limnological Assessment**

The water quality of Blanding City Reservoir #4 is very good. It is considered to be moderately hard with a range of hardness concentration of 80-92 mg/L (CaCO3).

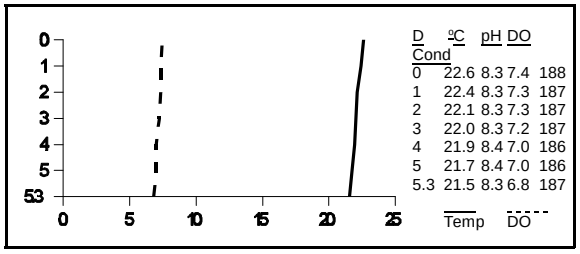
**Limnological Data**

Data sampled from STORET site: 595209

| **Surface Data** | 1981 | 1991 | 1992 |
|---|---|---|---|
| Trophic Status | O | M | O |
| Chlorophyll TSI | - | 39.19 | 27.10 |
| Secchi Depth TSI | - | 36.81 | 41.74 |
| Phosphorous TSI | 37.35 | 47.35 | 38.06 |
| Average TSI | 37.35 | 41.12 | 35.63 |
| Chlorophyll a (ug/L) | - | 2.4 | 0.7 |
| Transparency (m) | - | 5 | 3.55 |
| Total Phosphorous (ug/L) | 5 | 20 | 11 |
| pH | 8.4 | 7.9 | 8.5 |
| Total Susp. Solids (mg/L) | <5 | <3 | <3 |
| Total Volatile Solids (mg/L) | - | 2 | - |
| Total Residual Solids (mg/L) | - | 2 | 3 |
| Temperature (°C / °f) | 22/72 | 21/69 | 19/67 |
| Conductivity (umhos.cm) | 191 | 224 | 182 |
| **Water Column Data** | | | |
| Ammonia (mg/L) | 0.05 | 0.03 | 0.02 |
| Nitrate/Nitrite (mg/L) | 0.02 | 0.03 | 0.03 |
| Hardness (mg/L) | 84 | 100 | 81 |
| Alkalinity (mg/L) | 63 | 91 | 74 |
| Silica (mg/L) | - | 7.8 | 6.3 |
| Total Phosphorus (ug/L) | 5 | 24 | 9.0 |
| **Miscellaneous Data** | | | |
| DO (Mg/l) at 75% depth | - | 6.6 | 7.0 |
| Stratification (m) | - | NO | NO |
| Limiting Nutrient | N | N | N |
| Depth at Deepest Site (m) | - | 10.0 | 5.3 |

The only parameters that has exceeded State water quality standards for defined beneficial uses are phosphorus and temperature. In May, 1991 the average concentration of total phosphorus in the water column was 0.033 mg/L which is slightly higher than the recommended pollution indicator for phosphorus of 0.025 mg/L. Looking at phosphorus concentrations on an annual basis, they do not exceed pollution indicator exceedence levels. A review of the 1992 profile indicates that temperature exceed the standard established for Class 3A waters (20 degrees C)

throughout the water column. No other constituents analyzed indicate any water quality impairments. Although nutrient concentrations are in general considered low, the system has been defined as a nitrogen limited system. TSI values categorize the reservoir as oligotrophic in 1981 and 1992 but mesotrophic in 1991 in large part due to the increased




concentration of phosphorus in the lake. A difference of 8.46 units in the average trophic state between 1991 and 1992 appears to be significantly different. This may indicate that some event caused a temporary shift in water quality during 1991 but that conditions shifted back to a "state" more equivalent to earlier conditions in 1992. Until more information can be gathered the reservoir will be considered to be oligotrophic. A review of the lake profile of August , 1992 shows no stratification present with fairly consistent water quality throughout the water column.

Wildlife Resources maintains a fishery through annual stockings. The DWR stocks the reservoir annually with 8,000 catchable rainbow trout (*Oncorhynchus mykiss*).

Although macrophytes are present in the lade, their coverage is limited and they are not considered to be a major problem.

While the reservoir has not been chemically treated by the DWR to control rough fish competition, the reservoir was built away from any natural water bodies, so there are no native fish populations.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

| Species | Cell Volume ($mm^3$/liter) | % Density By Volume |
|---|---|---|
| *Ceratium hirundinella* | 0.936 | 82.89 |
| Pennate diatoms | 0.133 | 11.81 |
| Centric diatoms | 0.035 | 3.15 |
| *Ankistrodesmus falcatus* | 0.013 | 1.16 |
| Unknown spherical chrysophyte | 0.006 | 0.59 |
| *Oocystis sp.* | 0.004 | 0.39 |
| Total | 1.127 | |
| Shannon-Weaver [H'] | 0.62 | |
| Species Evenness | 0.32 | |
| Species Richness | 0.29 | |

As observed the algal community is dominated by green algae and diatoms indicative of mesotrophic state water.

**Information**

| | |
|---|---|
| **Management Agencies** | |
| Southeastern Association of Governments | 637-5444 |
| Division of Wildlife Resources | 538-4700 |
| Division of Water Quality | 538-6146 |
| **Recreation** | |
| Canyonlands Travel Region (Monticello) | 587-2231 |
| Kampark Campground (Blanding) | 678-2770 |
| **Reservoir Administrators** | |
| Blanding City | 678-2791 |
| San Juan County Water Conservation Distric | 678-2596 |

## Pollution Assessment

Nonpoint pollution sources include grazing of domestic livestock, and recreation. While the watershed is grazed in summer months, the reservoir area has some fencing to protect water quality.

There are no point pollution sources in the watershed.

## Beneficial Use Classification

The state beneficial use classifications include: culinary water (1C), boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).